IN THE SPECIFICATION:

Please amend the paragraph beginning at page 2, line 3, as follows.

Generally, a method and apparatus are provided for performing electronic equalization in optical communication systems. Optical noise in an optical receiver has a non-Gaussian nature. The present invention updates coefficient values in equalizers, such as feed forward equalizers or decision feedback equalizers, using higher-order algorithms in the Least-Mean-2Nth-Order family. In one embodiment, an optical receiver includes a photo-detector for converting a received optical signal to an electrical signal; and an equalizer for removing intersymbol interference from the electrical signal, the equalizer having ~~has~~ a plurality of coefficients that are configured to be updated based upon a least-mean $2N^{th}$-order (LMN) algorithm, where N is greater than one.

Please amend the paragraph beginning at page 2, line 24, as follows.

~~1.~~ In a decision feedback equalizer implementation, a first subtractor produces a second output signal that is a sum of one of the first output signals and a corresponding feedback signal; a slicer produces a predicted signal in response to each second output signal; a second subtractor produces an error signal representing a difference between the second output signal and a corresponding training signal or predicted signal; a feedback filter produces the feedback signal in response to corresponding ones of the predicted or training signals, the feedback signal being a weighted sum of the predicted or training signal, wherein weights in the sum being characteristics of the filter; and a controller updates the set of weights in response to the error signal, wherein the controller is configured to perform the updates based upon a least-mean $2N^{th}$-order (LMN) algorithm where N is greater than one. The controller updates a set of the weights $\vec{w}(k+1)$ at a time (k+1) as $\vec{w}(k) + \beta N[e(k)]^{2N-1}\vec{r}(k)$, wherein β is a preset step size, $\vec{w}(k)$ and $e(k)$ are respective sets of weight and error signals at a time k, and $\vec{r}^T(k) = [\vec{u}(k), -\vec{a}(k)]$, where $\vec{u}(k)$ is an input signal at the time k, and $\vec{a}(k)$ is a predicted or training signal at the time k.

Please amend the paragraph beginning at page 5, line 14, as follows.

As previously indicated, after square-law detection using a photodiode in an optical receiver, the noise becomes non-Gaussian (even though a small amount of ASE can be approximated as effectively Gaussian). FIG. 1 is a schematic block diagram of a conventional optical receiver 100. As shown in FIG. 1, an optical receiver 100 typically ~~tyipcally~~ filters the received optical signal using an optical filter 110, before converting the optical signal to an electrical signal using a photo-detector (diode) 120. The electrical signal is then amplified by an amplifier 130, and again filtered by an electronic filter 140, prior to performing a clock/data recovery process 150.

Please amend the paragraph beginning at page 11, line 18, as follows.

Automatic threshold control techniques (ATC) typically process raw analog input from the transimpedance amplifier (TIA). For the adaptive equalization associated with an aspect of the present invention, the input to the <u>ATC-SLICER</u> ~~ATC-ALICER~~ control block is the slicer input $s(k)$. In one of many possible digital implementations, a histogram is established in two arrays of memory, $bin_1(i)$ and $bin_0(i)$, for $i=0,...,B+1$ corresponding to the intervals $\{(-inf,-1),[-1,-1+d),[-1+d,-1+2d),...,[-1+(i-1)d,-1+id),...,[1-d,1],(1,inf)\}$, where $d=2/B$ and B is the number of bins that form the range from -1 to 1. The value of B dictates the accuracy of the final threshold determination but a large B value requires more memory space. For example, B could be 128, 256 or 1024. If $s(k)$ is in the interval of $[-1+(i-1)d, -1+id)$, then the count in the memory $bin_1(i)$ is incremented by one for the slicer output having a value of 1 and $bin_0(i)$ is incremented for the slicer output having a value of 0. The bit error can be estimated as follows:

- $e(0)=bin_1(0)-bin_0(0)$,
- $e(i)=e(i-1)+bin_1(i) - bin_0(i)$, for $i=1,...,B+1$.

The optimal threshold is determined by finding the minimum of $\{e(i)\}$. To avoid the detrimental memory effect for a changing optical channel, a reset signal is sent periodically to clear the memory arrays and a histogram is rebuilt fresh in accordance with the above rule.

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